Geomodel 2016 - 18th Science and Applied Research Conference on Oil and Gas Geological Exploration and Development, 2016

Accounting for the influence of logging tool decentering in acoustic logging data processing

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Abstract

It was carried out the processing of research results of acoustic logging sector equipment. This processing was carried out taking into account the separate registration of wave patterns into four independent spatial sectors. It was detected the significant difference in the arrival times of acoustic waves to the different sectors of equipment. Such difference can be caused by differences in characteristics of environment for well diameter, changing of the wellbore shape or decentering of the logging tool. Authors propose a formation procedure of monopoly or dipole wave packets considering the separate registration on different sectors and shifts between wave patterns. The difference in the values of interval times obtained for the wave packets recorded by the classical method and calculated with allowance for shifts between sectors can result to differences in the calculation of porosity coefficient to 4 or more absolute percent. Apart from the formation of the correct wave packet processing of wave patterns on different sectors allows to reveal the occurrence of elastic anisotropy for well diameter. In addition, analysis of interval time curves allows to reveal areas with occurrence of inclined layers in relation to the well.